

## CLAIMS

1. A process for treating ammonia containing wastewater comprising bringing an ammonia-treating material  
5 and ammonia containing wastewater into contact with each other to remove ammonia in the wastewater continuously as nitrogen gas,

the ammonia-treating material comprising a long carrier and complex bacterial sludge attached and immobilized on the  
10 carrier, the carrier comprising a net, a nonwoven fabric or a woven fabric comprising fibers or filaments, the carrier being attached to a support, the complex bacterial sludge comprising bacteria including autotrophic anammox bacteria and bacteria including autotrophic ammonia-oxidizing  
15 bacteria,

the ammonia containing wastewater containing dissolved oxygen at a concentration of not less than 0.5 mg/l.

2. The process for treating ammonia containing  
20 wastewater according to claim 1, wherein the bacterial sludge including autotrophic anammox bacteria are attached and immobilized on the fibers or filaments, and the bacterial sludge including autotrophic ammonia-oxidizing bacteria are attached and immobilized on an outer surface of the bacterial

sludge including autotrophic anammox bacteria.

3. The process for treating ammonia containing wastewater according to claim 1, wherein in the complex  
5 bacterial sludge, the bacterial sludge including autotrophic anammox bacteria are present within the bacterial sludge including autotrophic ammonia-oxidizing bacteria.

4. The process for treating ammonia containing  
10 wastewater according to any one of claims 1 to 3, wherein the ammonia-treating material and the ammonia containing wastewater are brought into contact with each other in one step.

5. The process for treating ammonia containing  
15 wastewater according to any one of claims 1 to 4, wherein the ammonia-treating material and the ammonia containing wastewater are brought into contact with each other while supplying air to the ammonia containing wastewater.

20 6. The process for treating ammonia containing wastewater according to any one of claims 1 to 5, wherein the ammonia-treating material is provided in an inner peripheral area in a reaction tank, the ammonia containing wastewater is supplied to the reaction tank, and air is supplied from a

central bottom part of the reaction tank to achieve a dissolved oxygen concentration of not less than 0.5 mg/l.

7. The process for treating ammonia containing  
5 wastewater according to claim 6, wherein air is supplied from a central bottom part of the reaction tank to generate an upward flow of wastewater in a central area in the reaction tank and a downward flow of wastewater in an inner peripheral area in the reaction tank.

10

8. The process for treating ammonia containing  
wastewater according to claim 7, wherein an air guide tube is provided in a central area in the reaction tank in a position such that a lower opening of the tube is opposed to the bottom  
15 of the reaction tank with a space from the bottom of the reaction tank, and air is supplied through the lower opening of the air guide tube to generate an upward flow of wastewater in the central area in the reaction tank.

20 9. The process for treating ammonia containing wastewater according to any one of claims 6 to 8, wherein the longer direction of the long carrier is perpendicular to the bottom of the reaction tank.

10. The process for treating ammonia containing wastewater according to any one of claims 1 to 9, wherein the fibers or the filaments are polyacrylic fibers or polyacrylic filaments.

5

11. The process for treating ammonia containing wastewater according to any one of claims 1 to 10, wherein the long carrier has a length to diameter ratio of not less than 3.

10

12. The process for treating ammonia containing wastewater according to any one of claims 1 to 11, wherein the bacterial sludge including autotrophic ammonia-oxidizing bacteria are attached and immobilized in a thickness of not less than 5 mm.

15

13. The process for treating ammonia containing wastewater according to any one of claims 1 to 12, wherein the ammonia containing wastewater in the reaction tank has a BOD concentration of not more than 20 mg/l.

20

14. The process for treating ammonia containing wastewater according to any one of claims 1 to 13, wherein the ammonia containing wastewater in the reaction tank has a

temperature of 30 to 40°C.

15. The process for treating ammonia containing  
wastewater according to any one of claims 1 to 14, wherein,  
5 the ammonia containing wastewater in the reaction tank has a  
pH of 7.4 to 8.0.